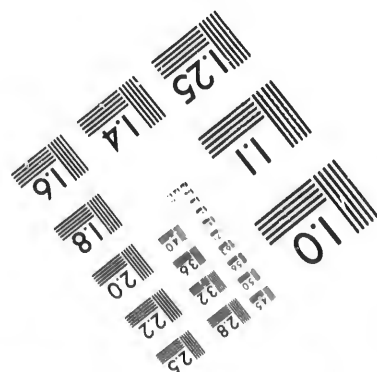
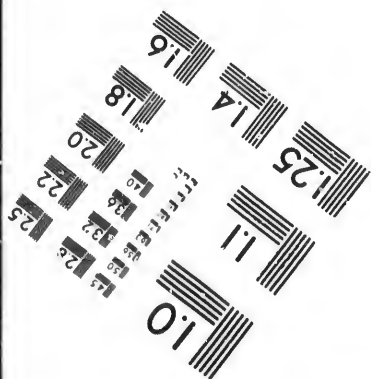
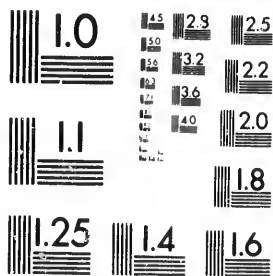


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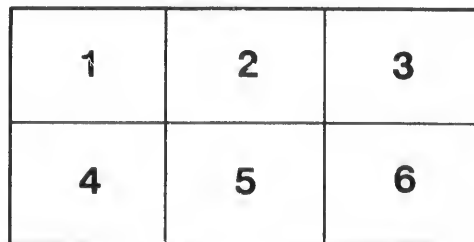
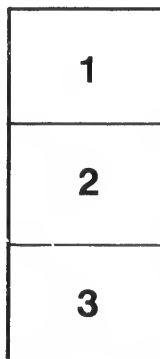
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The Failure of Gas Inspection in Halifax,

AND ITS RELATION TO THE

LATE HALIFAX GAS LIGHT COMPANY,

ALSO,

PEOPLE'S HEAT AND LIGHT COMPANY,

AND OTHER REMARKS IN CONNECTION WITH

GAS SUPPLY AT HALIFAX, N. S.,

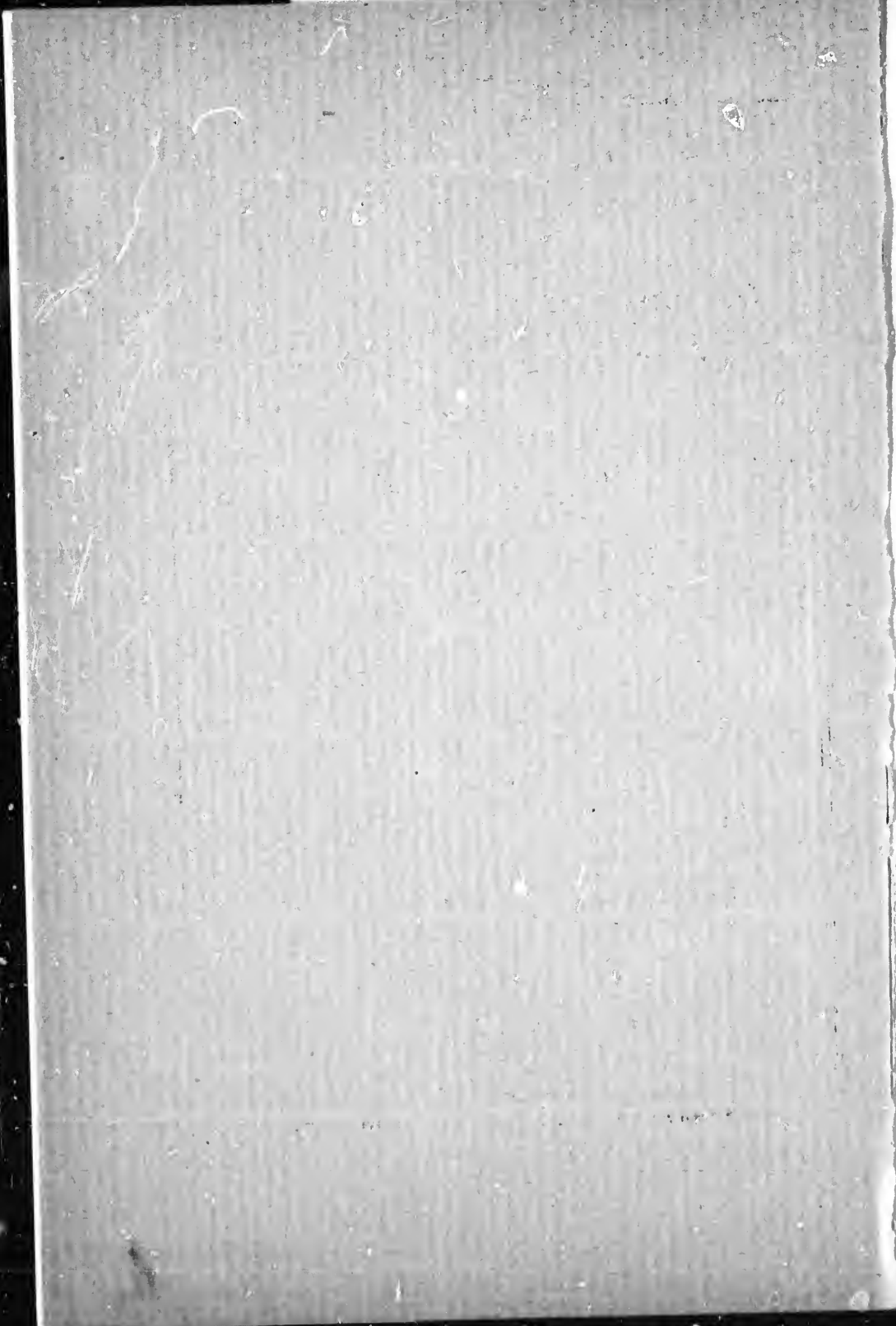
BY

W. P. BROWNE,

LATE OF HALIFAX GAS LIGHT CO., AND FORMERLY WITH JNO. VICKERY & CO.,
OWNERS AND LESSEES OF GAS UNDERTAKINGS, GAS ENGINEERS AND
METER MANUFACTURERS, EXETER, G. B.

HALIFAX, N. S. :

HOLLOWAY BROS., PRINTERS, 69 & 71 GRANVILLE ST.,
1900.



The Failure of Gas Inspection in Halifax, &c., &c.

HALIFAX, N. S., August 1, 1900.

During the present session at Ottawa, clause 36 of the Gas Inspection Act has been altered. From a taxpayer or gas consumer's standpoint the administration of gas inspection is so faulty, the wonder is that the time of Parliament should be engaged in so trifling a change. Apparently, the only effect will be to relieve four or five gas undertakings from paying fees amounting to \$9 per year each, and add \$6 each to some smaller ones.

The writer is familiar with the agitations and causes leading to the first Gas Inspection Act, 1861, in Britain. He was also a spectator in the gallery at Ottawa, 1873, when the first Dominion measure was under discussion.

The intent of gas inspection was to serve and protect the interest of the gas consuming public, the assumption being that gas undertakings were able to protect themselves. *Gas experts*, however, who have had the qualifying experience, know full well that the benefits to gas undertakings have been incalculable and to consumers problematical.

Before gas inspection in Britain, gas undertakings made *only very* moderate profits; *many* had a struggle to pay dividends even with high selling prices, but the inspection law has been one of the contributing causes for increasing profits in leaps and bounds, giving dividends of 7, 10, 12 and 14 per cent., with large margins for rest, and constantly diminishing selling rates.

Take the important factor "*the meter.*" When inspection was first introduced the inability of *dry* meters to register all their gas was so well known, gas undertakings were very slow to adopt them. *These* faults have been gradually overcome, and the dry meter is now popular.

Ninety per cent. of the meters in use were wet meters, gas undertakings being firmly persuaded they were an absolutely fair measuring instrument for buyer and seller, unless tampered with on the consumers' premises; stricter systematic observations, stimulated by the inspection law, gradually developed an awakening that the confidence had been a fool's paradise.

In the earlier history of gas undertakings 25 per cent. to 50 per cent

of gas made was commonly lost, unaccounted for. This was supposed to be due to condensations and leakages, principally from the street pipes, but closer observations made clear that meters were responsible for much of the losses, and in some cases the major part. These conditions have gradually changed in proportion to officers of gas undertakings having acquired comprehensive grip of the situation. Part of the mechanism of the early wet meter was a side tube for determining the full water line. When water was supplied without proper knowledge the tube lent itself to temporary fast registration, and consumers were often victims of their own zeal for watering the meters "*too frequently.*" The inspection law *did* abolish the possibility of this tube being made to operate to the consumer's disadvantage.

Another part of the mechanism still retained is the inlet valve — placed as a sentinel at the internal entrance of the meter, with a duty of warning when a condition is reached to pass gas without registering. Theoretically and by experimental testing this arrangement was generally accepted to be perfect, but later knowledge demonstrated that with *every day* working conditions the arrangement capriciously failed of its purpose, frequently resulting in a deviating discrimination against the gas undertaking.

The effect of this was variable bills, with universal dissatisfaction to consumers, who firmly distrusted meters and always believed the larger bills were evidences of guess work and imposition, when in fact the discrepancies were wholly in favor of the consumer.

Corroboration of the foregoing would be easy by reference to results outside Canada, but confirmation is more to the purpose if available within your own jurisdiction.

The character of a meter service cannot be fully appreciated without thorough internal inspection. This opportunity the writer had during 25 years' intimate association with the late Halifax Gas Co. and its meters, commencing 1873, a year before the Act was put in operation.

The Gas Co's. selling price at that time was \$3 per m. It had been higher, and the evidence of a series of systematic overhauls and radical reconstructions, in which the writer was chief factor, left no doubt in the writer's mind that if *all* the gas delivered through the meters to the company's consumers had been faithfully registered—the revenue yielded not only would have paid better dividends, but sufficient for the redemption of the whole of the capital—converting the undertaking into a free gift to its shareholders, with a premium over.

Anyone qualified by special knowledge is aware that conditions exist in a gas meter distributing service which will differentially vary losses by short registration. For example, suppose aggregate losses average 10 per cent. per meter, the liability is for higher per centage of loss with large consumers and lesser per centages with the smaller.

It will be out of place to name private firms or householders connected with striking cases of this nature which come to the writer's memory—there are, however, some not personal, to wit, the Richmond Station, Round House and Repair Shops of the N. S. R. This was a case where the meter certainly failed to register within 50 per cent. of the gas passed through it. After the absorption into the I. C. R., each department was served by separate meters, but the surroundings contributed to much intermittent registration, and in the case of the Round House it was occasionally so glaring that the bills had to be computed—and one quarter \$400 was added to the registered consumption with the concurrence of the then Locomotive Superintendent.

There are other cases connected with the Dominion, also the Imperial services, the banks, the newspaper offices, especially the "Chronicle," also some of the city churches and many large consumers, who received for years varying per centages of gas not charged in the company's bills.

All these meters were certified correct; some by the (hybrid) city gas meter inspection, the others by Dominion.

It must however be admitted that these losses were in part contributed to by the perfunctory work of the company's servants, and their inability to comprehend the unfavorable conditions when making their periodical inspections to see that all was in proper order.

All the foregoing is contrary to popular impressions, but this letter is only intended for limited circulation. Possibly, however, it may reach the eye of some who will think the reference to Halifax ought for personal reasons to be challenged and discredited, but the writer in advance questions their ability to do this on its merits.

The writer remembers a disputed meter case (reported in the London Gas Journal) protracted over several months by adjournments and fresh trials. Three different district inspectors after examination testified the meter to be correct, but finally it was found, "and not by the inspectors," that the index had an improper multiple.

Some instances of this character came to the notice of the writer in his Halifax experience. Two representative cases may be mentioned, one

being that of a brewery meter which owing to the first multiplier wheel having 25 teeth instead of 20, the meter registered 20 per cent. slow during the eight years it was at the brewery. The other case was a meter in use at a private house where the consumption had been invariably small but uniform. A disputed sudden jump in the registration led to examination, which revealed the index recording hundreds and thousands cubic feet correctly, but the multiple for tens of thousands having less than its proper quota of teeth, the recording became too fast.

The brewery meter had passed inspection under the city arrangement—the other by the Dominion inspection.

With the present methods of inspection it is not difficult for an expert to arrange indexes with various per centages of error, either slow or fast and inspectors will certify them correct. Two meters, Nos. 51,536 and 82,283, differing from each other 40 per cent, were certified correct in the Halifax office in January, 1897,—the inspector did not know these meters were only intended for cancellation and not for use.

The question of index inspection is not new—difficulties are thought to block the way which do not exist when it is recognized that indexes must be inspected before attachment to meters, and so constructed that separation of parts is impossible without destroying a revenue stamp, the absence of which should make the index illegal.

The Inspection Act penalizes use of unverified and sexennial unverified meters. When the old gas company went out of business they left a clean sheet, but the Blue Books show, relaxation of the obligation has been extended to the Halifax Heat and Light Co. This remission probably means a loss of \$700 to \$800 to the Inland Revenue, and the writer is of opinion if the census of the company's meters were taken to date quite 25 per cent in use would be found unlawful and liable to be destroyed under the terms of the Dominion Gas Act.

Glut of work in the chronically fossilized Halifax office will be the plea for the relaxation, but it would be interesting to learn if a double case of attempted nepotism has not been a factor.

Study of the Blue Book for '99, makes noteworthy that the cost of inspection for Halifax or N. S., was \$2,044 and the total income, including from E. Light, was \$1,246—deficit \$708, and that 501 E. Light and gas meters were inspected; while in British Columbia the cost was \$1,025, the income \$1,913, and surplus \$888, and 1,536 E. Light and gas meters inspected.

In Britain the scale of fees is one-fifth that of the Dominion, and they cover all cost of meter inspections.

The writer is not unacquainted with the inspection offices of the four eastern provinces, (not including P. E. I.,) also their incumbents, and the writer has known some of the latter to reject perfect meters owing to their own want of perspicacity to understand that meters had not the duty of maintaining a steady light if worked beyond their own proper indicated capacity.

What may be described as another of the idiosyncrasies of gas meter inspection is caused by inspector's inability to command the correct use of the standard test meter.

A standard test meter, to be a correct measure, depends on a positive water line—under every working condition—within its measuring drum. This water line is subject to displacements, varying with varying speeds, and the practical effect of which is a sensible and important difference in measurement, but adjusting attachments enable an operator of full knowledge to restore the water to the correct measuring line, in which condition the test meter is one of the most interesting, simple and perfect in the catalogue of gas testing apparatus.

The writer has known Dominion inspectors of many years' standing inspecting large meters unconscious of or misunderstanding the full use of the necessary adjustments, and in consequence rejecting positively correct meters, and repeatedly, if inspectors' interpretation of the necessary adjustment had been adhered to, other meters would have shared the same fate. In the latest instance of this kind which passed under the writer's observation, the rejection of the meter would have cost its owner \$12 for fees besides many a dollar for other consequent expenses.

The test meter is not in every day, use and an operator without good practical meter knowledge would likely forget mere mechanical manipulation for securing true measure—*therefore* he should be required say once a year, to give a sectional drawing (not always the same section) of the meter, showing effect of the water displacement within and outside the measuring drum—and to be sure that the subject was absolutely clear to his mental vision, the sectional drawing should be supplemented by a specification describing the correct, and also a wrong, method of adjusting *test meters*.

The foregoing has reference only to some of the idiosyncrasies of meter inspection, but the inspection of gas also in Halifax, for illuminating power, exhibits peculiarities, and it ought to be emphasized that previous

to the Dominion Inspection Act, the Halifax Gas Light Co., were supplying 24 c.p. gas and upwards, and notwithstanding the then selling price, \$3 per m., the cost of standard light to the consumers was cheaper than the present \$1.50 per m.,—true, part of this was due to the deficient registration of the meters.

The 4 or 5 cubic feet per hour burners of that period giving satisfactory light have later been displaced by burners consuming 6, 7 and 8 cubic feet per hour.

Illuminating gas for several causes is subject to frequent changes, and where inspection for c.p. is a positive reality, the average of every three days must come up to the required standard, or the penalties are strictly enforced, unless there be good cause for failure—say a break down of the plant or a strike of workmen.

The Blue Book for 1899 just issued shows that 21 tests for c.p. were made in Halifax during the year, and the average of the 21 tests is given at 17.10, but it may be safely claimed if 365 daily tests had been made the average result would have fallen very far short of the 16 c.p. standard. In fact the writer is sure an unbiased expert with trained physical vision for this specialty would often have pronounced the gas just 10 to 12 c. p. ; this would be about the lighting value of the company's heating gas when at its best.

The superficiality of c. p. inspection in Halifax cannot be better illustrated than by reference to the time required for the purpose of 21 tests. The exact time for the observations for each test being 10 minutes, and with a liberal allowance of an hour besides for each for preliminaries, calculations and entries, we find that 25 hours per year only is required to examine Halifax gas for illuminating power.

The Auer Lamp has reduced gas photometry to utter insignificance, and made the illuminating clauses of the Inspection Act *obsolete*.

The makeshift consumer may be willing to burn gas by the old method and content with 3.20 standard candle light per cub. ft. of 16 c. p. gas consumed, but the more enlightened consumer now burns his gas with an Auer Lamp, which yields him 10 to 12 standard candle light for every cub. ft., and the writer has reasons to believe Auer Lamps in use in Britain give even higher results.

The illuminating power of gas consumed in an Auer burner is not of material importance, but its calorific value is. This may seem to point to calorific instead of photometric test.

Commercial gases are not calorific in equal degree, or does the quality run on all-fours with candle power.

Calorific gas "*Excelsior*" is natural gas, but this of course can only be obtained in the neighbourhood of gas wells. But gas drawn from ordinary coal (without enrichment) is most generally available and best fills the bill, especially as a luminous naked flame is often desirable.

The editor of the *London Gas Journal*, and there is no higher authority, lately described the Auer Lamp as a radical revolution for gas lighting, and said the only desideratum now was clean cheap gas, free from ammonia and sulphuretted hydrogen.

This leads to the purity clauses of the Inspection Act. Gas purification was formerly a rule of thumb business, until the Metropolitan, (London) B. of Works led the way and appointed by Parliamentary authority a scientific board, viz., Profs. Letheby, Tindall, Huxlev, Crookes, Patterson and others of scientific eminence in succession, to experiment, control, and teach London gas undertakers how to reduce the system to a principle, and what was an erratic and perplexing difficulty, has now become a work of simple vigilant routine.

Elimination of the two impurities, ammonia (N H₃) and sulphuretted hydrogen (H₂ S) are now such simple processes, the mere occasional presence of the vile smelling H₂ S *unless through breakdown of the plant*, is an unpardonable neglect, and a condition suicidal for gas undertakings, calculated to drive consumers to the purer electric light.

The presence of N H₃ beyond a small limit in the distributed gas would be a serious detriment, causing obstructions and damage to the company's meters and corrosive obstructions to the consumers' fittings. This penalizes neglect to remove these impurities, and N H₃ being a marketable product puts a premium on its removal.

The Blue Books show that inspections were made in 6 only of the larger cities of the Dominion for sulphur compounds other than H₂ S. If these inspections have secured hygienic or commercial benefits then Hamilton, Winnipeg and 35 other places in Canada with gas supplies, where these inspections have never been made, are being wrongfully neglected.

These compounds are not pungent, and had no history in gas nomenclature until late in the sixties, when Prof. Letheby, "the appointed investigator after an exhaustive analytical inquiry for cause of decay of Leather (Book) bindings in some of the public offices, demonstrated the existence of these compounds" in London gas. Also that they were the

cause of the injury. The inquiry referred to offices where the consumptions were large, it was claimed, however, that a proper system of ventilation would have prevented the trouble. Gas never found favor for lighting important public libraries or other important public buildings unless all the products of combustion were excluded from the internal atmosphere. The introduction of the purer electric light has simplified the whole question, and extended the usefulness of many institutions formerly closed at sunset. This has considerably nullified objections to the non pungent compounds. The newer light has also superseded gas in stores and dwellings needing large volumes of light. The Auer Lamp, too, reduces the volume of these products. But *common* sulphur matches are responsible for sending into the breathing atmosphere more products of this character than is yielded by an ordinary consumption of gas. All this combined with the radical changes the science of lighting has and is undergoing, seem to relegate the present clauses of the Gas Inspection Act to a place among the antiquities.

Generally these particular compounds have never been considered important. In fact many of the largest municipal undertakings have been entirely free from the obligations. The Blue Books show that the average number of inspections in Halifax have been 19 per year for 3 years. This is good evidence that the Department at Ottawa have little faith in the practical importance of these inspections to the consumer.

After Prof. Lethby unearthed these products the metropolitan London authorities following up their fixed policy of putting *every possible* restriction on the gas undertakings, applied for parliamentary power to appoint examiners and referees to fix a limit. *The writer* has understood that a member of the Dominion Cabinet was then in London, and after his return introduced and carried the Dominion Inspections Act, incorporating features of the London special measure.

The administration of gas inspection in Britain is entirely municipal. The Acts simply enable Local Bodies *if they see fit* to provide such inspection as may seem best suited for their own local wants. In London, however, the conditions are so severe, and insisted on, they seem harrassing and oppressive.

The clauses of the Inspection Act were up before a Parliamentary Committee in 1884, the business being mainly to adjust the fees to make income meet expenditure.

Sir Richard Cartwright was reported to have strongly condemned charging the deficits incurred in administering the Act to the general taxes. The Blue Books contain the Commissioner of Standards apologies for this in his yearly reports.

Deficits with gas inspection do not occur at Montreal or Toronto, but surpluses, which rightly should go into the civic treasuries. Diverting these surpluses to help provide for deficits of inspection elsewhere, is as unreasonable as taxing the two cities for lighting other than their own streets. In the case of Halifax the aggregate deficits have been above \$20,000, without giving an iota of benefit to the consumers.

Protection is much needed both for gas consumers and investors (when street franchises are concerned), against the facility with which speculative promoters obtain legislative sanction for schemes which originate frequently with the object of wrecking undertakings in which investments have been made in good faith.

Under our constitution, perhaps, this question is more within the sphere of Provincial than Dominion polity.

We have read much lately about Canadian investments in undertakings promoted down amongst the Spanish Americans, but these people have forgotten their cunning if they are not exacting more than verbal promises from the promoters, which will have to be kept to the letter, or startling reprisals will ensue. It will be useless to plead that working results have not come up to anticipations.

In this way tens of millions sterling of European capital have been wasted in these states, but the original promoters make lots of money, and the investor in good faith goes to the wall.

While Spanish American methods are not to be commended, there should be parliamentary rules to bar promoters of mere speculative schemes obtaining valuable franchises without obligations to give substantial public benefits and against detriment to authorized existing undertakings.

An illustration to the point is the case of the Heat and Light Co. Four years ago Halifax woke up to the fact that the Provincial Legislature had given this company a charter. Although this was bound to disastrously affect the investors of \$400,000 in the Halifax Gas Co., not one in ten of its shareholders or one per cent. of the citizens had an idea

that a scheme of this character affecting their interest was under the consideration of the Legislature. It is questionable even if the Aldermen, who are supposed to be guardians of the civic interest, were cognizant of the exact privileges sought for or what obligations were to be imposed for the extraordinary right to drive an authorized undertaking out of the field. The dexterous way the H. and L. charter obtained sanction would lead to the assumption that the then Legislators and Aldermen did not realize at proper value the privileges being given away. Concessions to lay pipes, with right for all time to break up (costly) streets, are everywhere considered—"unless in very new or Mushroom Towns"—to be an important contribution to a gas undertaking, and the owners of the streets in reality become silent partners with substantial claims. If the Halifax Council, for purposes of its water supply, were to lay pipes across some private field or even waste land it would have to buy the privilege. But the H. and L. have full privileges of the streets without a *single obligation*, not even the maximum price of gas fixed. In fact they have lately increased the price of gas for heat purposes 60%, and this credits the company with the increased difference of heat value of the gas now supplied. And it will be no surprise to the writer to hear an early proposal to advance the price of gas for lighting purposes on the plea of dearer coal. Much will depend on the Electric Light Co., unless they fall into line. The cost of lighting by either system too nearly balances. The average cost of coal per ton which the old company converted into gas was at least $2\frac{1}{2}$ times higher than the value of coal gasified by the H. and L.

In the first decade of the century Mr. Winsor went to and fro in Britain advocating the advantages of a Bye-Product Gas scheme, to be named National Light and Heat, to abolish domestic coal fires, smoke and chimney sweeping, give incredible profits to investors, or if Parliament would nationalize the scheme, the Royalties could gradually clear off the National Debt and pay the annual maintenance of the *Army and Navy*.

When the Halifax H. and L. was being financially floated the inspired newspaper literature promised extraordinary developments from the undertaking. Fuel gas in embarrassing abundance to be had almost for the taking, also rich and cheap illuminating gas—both the result of their new system, changing what was old time secondary products into primary ones, which would cover all manufacturing charges and interest on capital, leaving large surpluses.

Abundant cheap fuel gas and the manipulation of the new products, were to add numerous industries contributing much to the city's prosperity.

There are elements in a coke oven system to enable it to hold its own for a town gas supply in a suitable locality, but the conditions do not exist in Halifax. Before the company had put a brick on their site the writer so expressed himself in conversation with a (now) member of the Dominion Cabinet, who thought the capitalists reported to be behind the undertaking understood what they were doing, but he regretted the probable disfigurement of the North West Arm.

Much was said in the inspired newspapers about the foreign capitalists who were interested in the undertaking as an experiment. It would be interesting to know how much they invested, and what they hold.

No experiments were needed, for every phase of the system had passed that stage, some of them decades back.

The whole history of the undertaking makes plain that the underlying object was promotion profits. For years there had been manoeuvring to Black-Mail, and failing that, to oust the old Gas Company. *One* in the *very* forefront of that movement told the writer that the old company was rich enough to *buy* off *any* opposition. But the skillful presentation of this visionary scheme apparently imposed on Legislators, Aldermen and the public. After the Charter was obtained one of the leading promoters, in a street conversation with the writer, confessed to no knowledge of the gas business, and that his object had been to make money for himself. However much or little of this may have been the object of others concerned, no doubt there is now awkward humiliation.

The abandonment of all the specialties of the scheme (differing from an ordinary gas works) leaving it capitalized to strangulation, is proof of its visionary pretensions.

It is a fixed principle in all settled communities that no street franchises be given to gas undertakings without securing the public from charges above what the natural local conditions make possible. When this is secured it means, if capitalization be too high, the investor suffers and not the consumer. This is a check against the evil of over capitalization.

The natural local conditions of Halifax are favorable for *very* cheap gas, but these advantages have been all nullified. However, with the present price of Electric Light in Halifax, Gas business at \$1.50 per M has no expansion, but is constantly declining. The growth of the city being slow *any* increased consumption due to a reduction of price will not improve the revenue. Therefore the H. and L. UNDERTAKING, WITH A

CAPITAL OUT OF ALL PROPORTION TO ITS POSSIBLE BUSINESS, will have a difficult position to face:

The weakness of the old Gas Company was its excessive capital \$400,000 (less than half that of the H. and L.) Much of this was sunk in unnecessary profitless property and costly enlargements of manufacturing plant out of all proportion to its needs. If the capital and business had been properly balanced they might have supplied gas at \$1 per M leaving good profits.

A point too often overlooked is, if other manufacturing or trading undertakings are overcapitalized and unable profitably to sell their goods at market prices, the consumer can *buy* elsewhere, but in the case of undertakings, (*say gas*), with exclusive monopoly of streets, the consumers are helpless. Therefore, representative bodies have a higher *duty* in guarding consumers' interest by limiting the capital to the actual needs of the gas supply, giving no power to *pay* promotion fees or issue watering stock, fixing an initial selling price of gas, with regulations to govern same in case of substantial changes in cost of raw material or labor, or economies due to any future improved system of manufacture, *and for the supplying, undertaking—absolute security from disturbance—without compensation.*

In addressing this to the Standards Department of the Inland Revenue the writer is aware that a portion of the contents is not relevant to its business, but it may be explained that the purpose of including the whole subject together is for information elsewhere.

W. P. BROWNE.

*To the Standards Department,
Inland Revenue, Ottawa.*

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